

REMARKS

The Office Action dated October 1, 2003, has been carefully considered. Claims 1, 17, 36, 41 and 43 have been amended. Claims 12, 13, 25, 35 and 35 have been cancelled. Claims 44 and 45 have been added. Claims 1-11, 14-24, 26-33 and 36-45 are in this application.

The drawings were objected as missing Fig. 7B. Proposed Fig. 7B is submitted herewith. Support for Fig. 7B can be found throughout the specification, and in particular, on page 6, lines 20-26. No new matter has been added.

Claims 9, 25 and 33 were objected as not providing antecedent basis for "said heat curable ink." Claim 1 has been amended to provide antecedent basis for heat curable ink.

The previously presented claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,606,914 to Borgardt in view of U.S. Patent No. 6,161,930 to Asano, and further in combination with U.S. Patent No. 3,576,367 to Sable, U.S. Patent No. 3,905,533 to Corse, U.S. Patent No. 4,023,894 to Goel, U.S. Patent No. 5,662,977 to Spain et al., U.S. Patent No. 6,371,019 to Bosen et al., and U.S. Patent No. 5,656,083 to Schonberger.

Borgardt discloses a method and apparatus for printing of foil webs by web offset printing. An unwinding unit (2) is used to unwind a foil material from a roll. A printing device is used to apply a strongly oxidatively drying ink. The printed foil webs are subjected to a combined heat-air drying. After printing, the foil webs are conducted over a cooling roll. A winding device is used with web tension contact to reduce the tension of the web with the increase in diameter of the roll upon winding.

In contrast to the invention defined by the present claims, Borgardt does not teach or suggest a method or system for printing directly on an extruded sheet from an extruder having an elevated temperature in the range of about 250° F to about 450° F. Further, Borgardt does not teach or suggest that the ink applied to the extruded sheet having an elevated temperature is heat curable or evaporable. To the contrary, Borgardt teaches applying ink to a foil web after unwinding the foil web. There is no teaching or suggestion in Borgardt of applying ink to an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F. Rather, Borgardt teaches away from the present invention by cooling a plate cylinder used in applying the ink to a temperature of about 23° C (73.4° F). (Col. 4, lines 61-63.) In addition, the

heat air-drying apparatus of Borgardt does not teach or suggest providing an elevated temperature in the range of the presently claimed extruded elevated temperatures.

Furthermore, Borgardt does not teach or suggest applying heat curable or evaporable ink to an extruded sheet having an elevated temperature. As described on page 2, lines 7-9, in the present invention, the ink cures immediately upon contact with the extruded sheet having an elevated temperature. In contrast, Borgardt teaches using heating or drying after the printing step for oxidatively drying the inks. Accordingly, Borgardt does not teach or suggest inks which are curable upon contact with an extruded sheet having an elevated temperature.

Asano discloses a method and apparatus for preheating a printing medium in a hot melt ink jet printer. Paper is heated rapidly to a temperature to ensure ink fixing performance of the print. The surface temperature of a preheat platen is set at 78° C (172.40° F) and the temperature of the main platen is set at 68° C (154.40° F). (Col. 5, lines 12-15.) In contrast to the invention defined by the present claims, Asano does not teach or suggest applying ink to an extruded sheet which has a temperature in the range of about 250° F to about 450° F. Rather, Asano teaches heating a sheet of paper to a lower temperature of about 172.4° F. Further, there is no teaching or suggestion in Asano of applying a heat curable or evaporable ink to the sheet having an elevated temperature. Accordingly, Asano does not cure the deficiencies of Borgardt noted above and the invention defined by the present claims is not obvious in view of the combination of Borgardt and Asano.

Sable teaches an apparatus for printing variable data constituting a succession of documents with control symbols in a first machine and overprinting appropriate forms of a background over the variable date in the second machine. The web is fed over a roller 29 so to face the printing outward on drum 31. Col. 3, lines 35-40. Drum 31 has gated suction ports to hold documents around the drum.

Sable does not teach or suggest a method or system for printing directly on an extruded sheet from an extruder having an elevated temperature in the range of about 250° F to about 450° F. Further, Sable does not teach or suggest that the ink applied to the extruded sheet having an elevated temperature is heat curable or evaporable. Rather, Sable is related to printing data on

paper which is unrelated to the extruded sheet of the present invention. In addition, Sable does not teach or suggest that an extruded sheet can be held in place by a vacuum against a drum.

Furthermore, there is no motivation to combine Borgardt related to printing on foil with Asano and Sable directed to printing on paper. Applicants submit that the properties of foil are much different than the properties of paper and one of ordinary skill in the art would not combine the process of printing on paper with the process of printing on foil. Further, none of the references, alone or in combination, uses a vacuum to hold an extruded sheet. The present invention provides a vacuum to hold the extruded sheet to overcome any problem of movement of material, stretching or wrinkling. In contrast, Borgardt is directed to foil which will not have movement during printing. Asano and Sable directed to paper also would not have movement during printing. Accordingly, none of the references, alone or in combination, teach printing on an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F and applying a vacuum to hold the extruded sheet against a drum.

Corse is directed to an apparatus for regulating tension in sheet material. An impression cylinder of a flexible material is driven in rotation with a printing cylinder. In contrast to the invention defined by the present claims, Corse does not teach or suggest a method or system for printing on an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F. Further, Corse does not teach or suggest that the ink applied to the sheet having an elevated temperature is heat curable or evaporable. Also, Corse does not teach or suggest applying a vacuum to hold the extruded sheet against a drum which is formed of a flexible material. As described on page 4, line 9-12, the drum of the present invention is formed of a flexible material to allow the extruded sheet to lay flat during application of vacuum. In contrast, the drum of Corse is used during printing of a paper sheet without application of a vacuum. Accordingly, Corse does not cure the deficiencies of Borgardt and Asano noted above.

Goel discloses a copying apparatus in which an image of charged particles of imaging material is transferred from one supporting surface to a sheet of support material, while the sheet of support material is held on an apertured vacuum belt and an electrical transfer field is applied thereto, where the vacuum belt comprises electrically relaxable material to prevent print-out of

the vacuum apertures on the support material. The copying apparatus includes a multiple registered transfer system for color copying with reciprocating of the supporting vacuum belt.

In contrast to the invention defined by the present claims, Goel does not teach or suggest a method or system for printing on an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F. Further, Goel does not teach or suggest that the ink applied to the sheet having an elevated temperature is heat curable or evaporable. Further still, Goel does not teach or suggest using a vacuum belt with an extruded sheet. Accordingly, Goel does not cure the deficiencies of Borgardt and Asano noted above.

Spain et al. teach a process of making plastic siding panels with an embossed wood grain pattern by overlying an extruded sheet, a flexible carrier sheet and a matte release layer bonded to the carrier sheet. An embossing roll applies pressure at elevated temperatures to transfer the decorative coating to the release layer.

In contrast to the invention defined by the present claims, Spain et al. do not teach or suggest a method or system for printing on an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F. Further, Spain et al. do not teach or suggest that the ink applied to the sheet having an elevated temperature is heat curable or evaporable. Furthermore, there is no teaching or suggestion in Spain et al. of embossing an extruded sheet after applying heat curable ink. Accordingly, Spain et al. do not cure the deficiencies of Borgardt and Asano noted above.

Bosen et al. teach a device for selectively positioning at least one cylinder in a print machine. In contrast to the invention defined by the present claims, Bosen et al. do not teach or suggest a method or system for printing on an extruded sheet having an elevated temperature in the range of about 250° F to about 450° F. Further, Bosen et al. do not teach or suggest that the ink applied to the sheet having an elevated temperature is heat curable or evaporable. Accordingly, Bosen et al. do not cure the deficiencies of Borgardt and Asano noted above.

Schonberger teaches a device for inking a cylinder having depression thereon including a chamber doctor body to which a holder is pivotally connected. The holder is connected to the doctor blade. In contrast to the invention defined by the present claims, Schonberger does not teach or suggest a method or system for printing on an extruded sheet having an elevated

temperature in the range of about 250° F to about 450° F. Further, Schonberger does not teach or suggest that the ink applied to the sheet having an elevated temperature is heat curable or evaporable. Accordingly, Schonberger does not cure the deficiencies of Borgardt and Asano noted above.

In view of the foregoing, Applicants submit that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should he believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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